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R E M A R K S

Reconsideration of the application is respectfully requested in view of the amendments to the specification, claims and drawings, coupled with the following remarks.

The specification has been amended to more clearly describe the cross-section of the tubular structure by referring to it as "curved in cross-section". This terminology limits the interpretation of "tubular structure" in that the tubular structure is not rectangular or square in cross-section. Basis for the amendment to the specification and the claims in the reference to the cross-sectional shape of the tubular structure is not new matter as it has basis in the original application as filed. Figure 1 of the drawings discloses the flap 34 in its two positions, the first position being the solid line position with the peripheral edge 38 made up of the side edges and upstream edges in engagement with the wall of the tubular structure, but the wall of the flap 34 is not in such an engagement. Consequently, with the disclosure of the drawings and the description of the flap in its two positions, the added material to the specification and to the claims is believed inherent and not new matter.

In addition to amending the specification, the drawing has been amended to add the numeral 48 and thus obviate the Examiner's objection found in paragraph 5 of Part III.

In the outstanding Official Action of July 9, 1981, the Examiner rejected claims 1 and 2 as fully met under 35 USC 102 by the reference to Shipman 3,685,293. Claims 3 and 4 which

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depended respectively from claims 1 and 2, were also rejected on this reference but with the additional reference of Marchant 3,310,951. The rejection of claims 3 and 4 was under 35 USC 103.

After carefully reviewing the Official Action and the art cited, applicant has cancelled the originally presented independent claim 1 and replaced the same by the new independent claim 5. It is believed the new independent claim 5 more clearly brings out the inventive concept of this application in structural terms which distinguishes the invention from the art of record, taken singly or in any valid combination.

The purpose of the present invention is to provide a variable thrust nozzle for a gas turbine engine in which the structure of the nozzle can have the outlet area varied without it being weakened. In this respect, only a single flap is used, and it must be pivoted at its downstream end to the tubular structure adjacent the exhaust gas outlet on an axis extending across the outlet. The flap extends forward in the tubular structure and is pivotable between two positions. The first position is a position where the exhaust gas outlet has its smallest area, and the second position is to a position where the area of exhaust gas outlet is at a maximum.

In more detail, the newly presented claim clearly brings out the relationship of the flap because of its shape to the tubular structure when in its first position and when in its second position. In this respect, the flap, when in

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its first position slopes toward and engages the interior wall of the tubular structure along its upstream edge with its side edges also sealingly engaging the interior wall of the tubular structure. It should be noted that when in this position the wall of the flap slopes and is spaced away from the interior wall of the tubular structure. In the second position, the wall of the flap is parallel to the interior wall of the tubular structure and, thus, gases can flow on both sides of the flap through the outlet 32, with the outlet being at its maximum area as shown at 42 in Figure 2.

Turning now to the primary reference, namely, the Shipman patent 3,685,293, there is disclosed an exhaust control for the tubular housing of the jet pipe of a gas turbine engine, the exhaust control including a pair of funnel blades 20 pivoted at their upstream end as indicated at 22. The funnel blades 20 control the velocity of the gas flow in the tubular housing 10 as it is discharged from the exit end by varying the area of discharge. When the funnel blades 20 are in the position shown in Figure 3, they have reduced the interior diameter of the tube at 25. When in this position, the edges of the funnel blades are not in sealing engagement with the tube but are in sealing engagement with each other. This is made clear in column 2, lines 10 through 14. On the other hand, when the funnel blades 20 are in the position shown in Figure 2, only the wall of the funnel blades along a line in an axial plane through the funnel blades is in engagement with the interior wall of the tubular housing 10.

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The newly presented claim 5 clearly avoids the structure shown in Shipman and would not be rendered obvious thereby. First, in applicant's claimed invention, the flap is pivoted at its downstream end and extends upstream as opposed to Shipman. Additionally, the claim specifically calls for the flap to be sloping toward the wall of the tubular structure and to have its side and upstream edges in sealing contact with the wall of the tubular structure when in the first position of reduced area for the exhaust gas outlet. This is not found in Shipman.

The present invention, unlike Shipman, permits a variable area thrust nozzle to be designed which utilizes only a single flap rather than two flaps in a tubular nozzle having a curved cross-section. Single flaps have only been used in the past in square nozzles or rectangular nozzles and these flaps have been pivoted at their upstream end similar to the Shipman nozzle. The present invention, on the other hand, permits use of a single flap in a nozzle which is curved in cross-section and preferably circular rather than rectangular or square. A curved or circular cross-section nozzle has added strength over a rectangular or square nozzle, and in the present invention applicant has avoided the added weight of a pair of flaps to perform the function of varying the area.

The Marchant patent 3,310,951 merely discloses an elbow-type nozzle which may be rotated so as to provide for vector thrust. This feature, by itself, is recognized as

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old by applicant, but it is believed that the feature in combination with the variable area thrust nozzle of the present invention is novel as it provides a structure wherein the use of a single flap does not add to the frontal area of the power plant. Consequently, it is believed that claims 3 and 4 should be allowed with independent claim 5 and dependent claim 2.

It is respectfully requested the Examiner reconsider the application in view of the amendments thereto coupled with the above remarks. It is submitted that all claims now present in the application contain patentable subject matter and should be allowed.

If the Examiner feels that an interview will advance prosecution of this application, then such an interview is requested and may be arranged, at the Examiner's convenience, by telephoning applicant's counsel, Lloyd J. Street, at 861-3000.

Respectfully submitted,

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